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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/922,650 | 08/07/2001 | Jeffrey M. Voas | CIG-102 | 9193 |
| 28970 | 7590 | 01/19/2005 | EXAMINER | |
| SHAW PITTMAN IP GROUP 1650 TYSONS BOULEVARD SUITE 1300 MCLEAN, VA 22102 | | | IQBAL, NADEEM | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2114 | |

DATE MAILED: 01/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/922,650

Applicant(s)

VOAS ET AL.

Examiner

Nadeem Iqbal

Art Unit

2114

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 12 and 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 14-18 and 20-28 is/are allowed.
- 6) ☐ Claim(s) 1-11 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims 12 & 19 are canceled and are not considered any further for this office action.

Claim Objections

1. Claims 11 & 13 are objected to because of the following informalities: Claim 11 is dependent on itself. It needs to be changed to a preceding claim. Claim 13 is indicated to be dependent upon a rejected claim 12, its dependency needs to be changed. Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Voas et al., (“Predicting how badly “Good” software can behave”, IEEE Software 14(4), Pages 73-83, 1997).

3. As per claim 1, Voas et al., (Voas) teaches (page 74, col. 1, lines 23-25) a software analysis technique (EPA) that uses the injection of artificial faults both hardware and software to test software’s tolerance to unusual events. He thus teaches limitations pertain to a method of identifying data state anomalies capable of causing a catastrophic failure in a continuously operating software system. He also teaches (page 74, col. 3, lines 32-35, page 75, col. 1, lines 39-41) fault injection to alter data state values during program execution and collects information concerning whether program outputs are unacceptable. He thus teaches limitations pertain to

inserting an assertion into the software system, running the software system after the data state anomaly has been injected, trapping values that produces hazardous output. He also checks for unacceptable output and logs the unacceptable output, since he teaches as stated above collects information concerning whether program outputs are unacceptable.

4. As per claim 2, Voas teaches (page 77, col. 3, lines 30-33) his technique and method as applied to a program code for Boeing 737 autopilot. He thus teaches a software system comprising a safety-critical system where unacceptable output comprises a hazardous output.

5. As per claim 3, Examiner takes official notice that a continuously operating software system comprises a web site system, since it is well known in the art that a software system that runs a web site is a continuously operating software system.

6. As per claim 4, Voas teaches as stated above per claim 1, fault injection to alter data state values during program execution and collects information concerning whether program outputs are unacceptable. Therefore unacceptable output comprises an undesired output.

7. As per claim 5, Voas also teaches (page 75, col. 3, lines 17-19) that EPA is used for assessing whether a program is likely to produce hazardous out puts. The hazardous outputs would be an unacceptable performance property.

8. As per claims 6 & 7, Voas teaches (page 78, col. 3, lines 51-53) control system guarding against the possibility that one of the six electromagnets or one of six power supplies may fail, a failure causing a distorted magnetic field around brain, and the software has been designed to quickly shut down.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voas et al., ("Predicting how badly "Good" software can behave", IEEE Software 14(4), Pages 73-83, 1997).

12. As per claim 8, He does not explicitly disclose repeating each of the steps using second data state anomaly, the second data state anomaly different than the first data state anomaly. He already teaches as stated per claim 1 above that Voas teaches (page 74, col. 1, lines 23-25) a software analysis technique (EPA) that uses the injection of artificial faults both hardware and software to test software's tolerance to unusual events. He also teaches (page 74, col. 3, lines 32-35, page 75, col. 1, lines 39-41) fault injection to alter data state values during program execution and collects information concerning whether program outputs are unacceptable. It would have

been obvious to a person of ordinary skill in the art to realize that He would repeat the steps performed for the first data state anomaly for a second data state anomaly, which is different than the first data state anomaly. This is because he teaches fault injection to alter data state values during program execution and collects information concerning whether program outputs are unacceptable, therefore he would clearly has to repeat steps for a second data state anomaly, since it is different than the first data state anomaly and would produce different results.

13. As per claim 9, Voas teaches to uses fault injection to alter data state values during program execution and collects information concerning whether program outputs are unacceptable. It would have been obvious to a person of ordinary skill in the art to realize that He would stop the software system if a pre-determined period has elapsed without an unacceptable behavior being observed, since He collects information concerning whether program outputs are unacceptable, and if no unacceptable outputs are observed, he would stop the software system.

14. As per claim 10, Voas teaches to uses fault injection to alter data state values during program execution and collects information concerning whether program outputs are unacceptable. It would be obvious to a person of ordinary skill in the art to realize that his pre-determined period comprises a time period, since he teaches to collect information concerning whether program outputs are unacceptable, therefore would perform collecting information for a per-determined period of time.

15. As per claim 11, Voas teaches as stated above to use fault injection to alter data state values during program execution and collects information concerning whether program outputs

are unacceptable, therefore his pre-determined period would comprise a predetermined number of iterations of software system.

16. As per claim 13, Voas teaches (page 77, col. 1, lines 43-46) to identify specific software hazards that can originate, so that safety improvements can be undertaken. He thus provides motivation to a person of ordinary skill in the art to insert a corrective action into the software system once specific software hazards are identified.

Allowable Subject Matter

17. Claims 14-18, 20-28 are allowed.

Conclusion

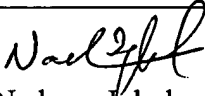
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadeem Iqbal whose telephone number is (571)-272-3659. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W Beausoliel can be reached on (571)-272-3645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number:
09/922,650
Art Unit: 2114

Page 7


Nadeem Iqbal
Primary Examiner
Art Unit 2114

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